NEAR FIELD COMMUNICATIONS FOR TRAFFIC AND HAZARD MAPPING

FIELD

[0001] The subject matter described herein relates to navigation.

BACKGROUND

[0002] Navigation systems have become an increasingly common part of vehicles today. Indeed, many smartphones now carry turn-by-turn navigation applications that provide navigation, mapping, and other route information, such as traffic, hazards, and the like. More recently, navigation systems have added crowd-based sources of information. Rather than rely on expert traffic systems, any user can report traffic conditions using the turn-by-turn navigation application. The navigation system may then use the reports to enhance its navigation by providing more up to date, accurate traffic information, and the like.

SUMMARY

[0003] Methods and apparatus, including computer program products, are provided for reporting hazards and other events. In one aspect, there is provided a method. The method may include receiving, at a user equipment, an indication representative of a selection of a near field communication tag; determining, at the user equipment, an event assigned to the selected near field communication tag; determining a location corresponding to when the selection occurred; and sending, by the user equipment, a message including the event and the determined location.

[0004] In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The indication may represent a radio frequency signal carrying an identifier for the near field communication tag. The user equipment may further include an application that programmatically sends the message without requiring user access to the application. The application may be at least one of always on and running in a background mode. The near field communication tag may be preconfigured to represent the event. The event may include at least one of a road hazard, a traffic condition, and a mapping error. The near field communication tag may comprise an active near field communication tag including a switch to enable selection. The near field communication tag may be removably affixed to at least one of a dashboard or a steering wheel. The sending may further include sending the message to a server, wherein the server aggregates traffic information from a plurality of user equipment and sends navigation information including alerts to a plurality of user equipment.

[0005] The above-noted aspects and features may be implemented in systems, apparatus, methods, and/or articles depending on the desired configuration. The details of one or more variations of the subject matter described herein are set forth in the accompanying drawings and the description below. Features and advantages of the subject matter described herein will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF THE DRAWINGS

[0006] In the drawings,

[0007] FIGS. **1**A-**1**B depict example systems for near field communication (NFC) based reporting of events, such as hazards, road conditions, and the like, in accordance with some exemplary embodiments;

[0008] FIG. **1**C depicts an example of a dashboard including NFC tags, in accordance with some example embodiments;

[0009] FIG. **2** depicts an example of a process for near field communication (NFC) based reporting of events, in accordance with some example embodiments;

[0010] FIG. **3** depicts an example of a user equipment, in accordance with some example embodiments; and

[0011] FIG. **4** depicts an example of a base station, in accordance with some example embodiments.

[0012] Like labels are used to refer to same or similar items in the drawings.

DETAILED DESCRIPTION

[0013] Although mapping including navigations systems relying on crowd sourcing have become more prevalent, these systems may require a user to access a smartphone where the navigation system is resident in order to report traffic information. This may present at least two problems. First, it takes time for a user, such as a driver, to pick up the smartphone and report traffic condition. This time represents a hazardous driver distraction. Second, the reporting time actually decreases the accuracy of the reporting. For example, if it takes a driver 1 minute to report the traffic hazard, the reported location of the hazard, when the driver is going 60 miles per hour, may be incorrect by up to 1 mile. In some example embodiments, the subject matter disclosed herein provides near field communication (NFC) tags that can be readily accessed by a user, such as a driver, to report an event, such as a road hazard, traffic conditions, map errors, to a mapping application at a user equipment, such as a wireless device, smart phone, and the like. According to some example embodiments, an event may be referred to as a Point of Interest (POI) on a map or a navigation system. The mapping application may be configured to not require user access to the mapping application in order to report the event to a server. To illustrate by example, a driver encountering a road hazard, such as an object in the road, may select a NFC tag placed within, for example, easy reach of the driver. When selected, the NFC tag sends a radio frequency signal to the mapping application, which programmatically decodes the signal, determines the identity of the NFC tag and its corresponding function (which in this example is road hazard), determines the location when the NFC signal is received, and then reports at least the hazard and its location to a server.

[0014] FIG. **1**A depicts an example of a system **100** including a vehicle **199** including one or more near field communication (NFC) tags **192**A-D and a user equipment **114**, which further includes a mapping application **190**, in accordance with some example embodiments.

[0015] In some example embodiments, each of the NFC tags **192**A-D may be associated with a certain event, which may be reported to mapping application **190**. Moreover, NFC tags **192**A-D may be placed within easy reach of a user, such as a driver, of vehicle **199** (for example, placed on a steering wheel, dashboard, and the like).

[0016] To illustrate further, NFC tag **192**A may be implemented as a pressure sensitive NFC tag, which when selected (for example, by simply pressing the tag) sends a radio frequency signal identifying that NFC tag **192**A has been selected. This NFC signal may be received by user equipment **114** including mapping application **190**. The mapping appli-